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SB
STATISTICAL BULLETIN

Vol 66 No 4 Oct-Dec 1985

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From the Editor's Desk

Diabetes mellitus (sugar diabetes) presents *SB* with an important finding this issue. The mortality rate for the disease declined sharply in the past decade, by nearly one-third. Our discovery of this change came unexpectedly as a result of an earlier editorial staff decision to study diabetes because of its public health significance. When we realized the magnitude of this decline, we sought to explain its cause. One consequence of our efforts was to ask Dr. Maureen Harris, a nationally recognized authority on diabetes, to provide a commentary for our readers, which you may also read in this issue. The most remarkable thing about this beneficial change is that no good explanation has been offered for it. Because diabetes may afflict 5 percent of adult Americans, such a decrease, if it persists and has widespread, healthy effects, could materially contribute to the continued decline in atherosclerotic disease in the United States.

Some Disconcerting Cancer News

In the second article to appear in *SB* about the closing gap in women's mortality rates from lung and breast cancer, an analysis and report present differences in death rates by regions of the United States and by individual states. What is happening in the states and parts of the country you are familiar with, those in which you live, work, or have traveled? Clearly, not all states are comparably afflicted, but the degree of variation in lung cancer death rates, with a few exceptions (e.g., North Dakota, Utah), tends to be unremarkable. In other words, smoking and women's lung cancer is a real national problem.

Respiratory cancers are an important international health problem for men and women, as our article on that subject attests. Though the increased death rates have slowed in many western countries, they are still appallingly high in the United Kingdom, for example.

Continued Cost Analysis: T&A

Tonsillectomy and adenoidectomy (T&A) are analyzed as a part of our continuing series on the charges and the lengths of stay in the hospital for the common surgical procedures, as shown by regions of the United States. Though declining in their rate per capita, T&As remain a major procedure in the 1980s, and one that appears on most surgical second-opinion lists in 1985. □

Charles B Arnold

The Statistical Bulletin will publish comment and criticism from readers about its contents. Alternate interpretations of data analyses or different points of view about subjects are particularly welcome. Use address at end of publisher's statement opposite page.

Diabetes Mortality Sharply Declined in Past Decade

In the United States there were an estimated 35,500 deaths from diabetes mellitus in 1984 or approximately the same number as in 1983. Although the number of deaths from diabetes has apparently increased somewhat from the final count of 34,583 in 1982, the mortality toll from this disease only accounts for less than 2 percent of all deaths. Nonetheless, diabetes currently ranks as the 7th leading cause of mortality in our country. Moreover, the relative ranking would rise to 5th place if diseases of the heart and cerebrovascular diseases were to be combined into one category and if accidents—a nondisease cause of death—were excluded. Notwithstanding, the importance of diabetes is still greatly understated because the present coding system selects a single underlying cause of death in tabulating mortality statistics and excludes deaths from diabetes when mentioned as a contributory cause on the death certificate. Diabetes is implicated as an associated cause of death or a significant risk factor in a substantial proportion of deaths from other causes, particularly those of the cardiovascular-renal system.[1,2]

Etiology and Epidemiology

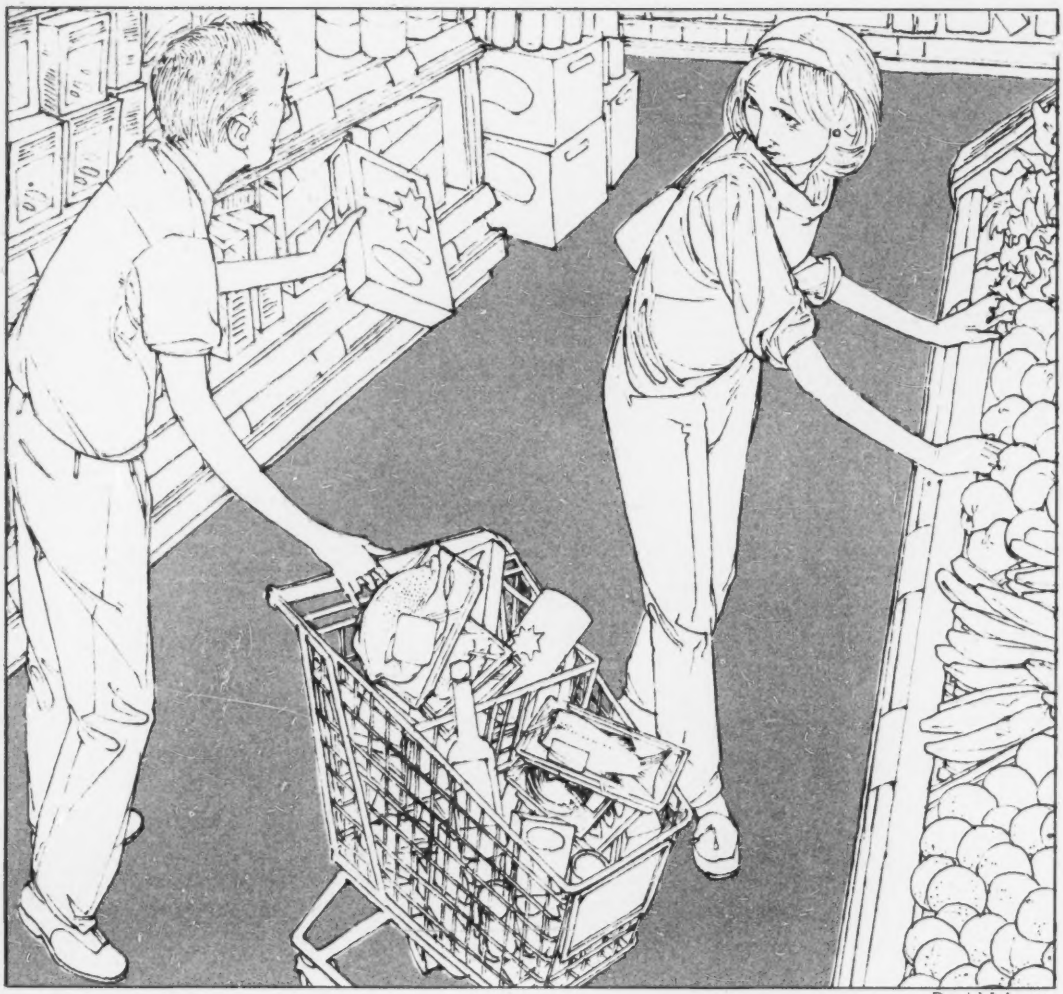
Diabetes results from the interaction of various hereditary and environmental factors, and is characterized by abnormal insulin secretion along with a variety of metabolic and vascular indications. It is a certifiable chronic, nonhomogeneous disease because its signs and symptoms are exhibited over a period of years and the several subcategories display different patterns.

The varying manifestations of diabetes are not just clinical, they also appear in the epidemiology of the disease. Thus, diabetes occurs more frequently in industrialized countries, generally in more affluent societies, among older populations, and has been characterized by a greater prevalence and higher mortality among women. In the United States, the sex differential in mortality has been recently reversed; death rates are now generally lower among females than among males. In addition, for both sexes there have been some substantial reductions in regional mortality rates, although significant geographic disparities remain. The following analysis is the first in a new series of *Statistical Bulletin* articles that will present regional statistics based on the 1980 population census and deaths which occurred in 1979, 1980 and 1981.

In the United States, the sex differential has been recently reversed; death rates are now generally lower among females than among males.

Overall Decline in Rates

In the United States during 1979-81, mortality from diabetes among white males aged 45-74 averaged 24 per 100,000, compared with 32 per 100,000 in 1969-71—or a reduction of 25 percent. Among white females the corresponding death rates were 21 per 100,000 and 31 per 100,000 respectively, representing a 32 percent decline. The sex differential in mortality in favor of white females is now 3 per 100,000, widening from 1 per 100,000 in 1969-71, and continuing the reversal that occurred after 1959-61.

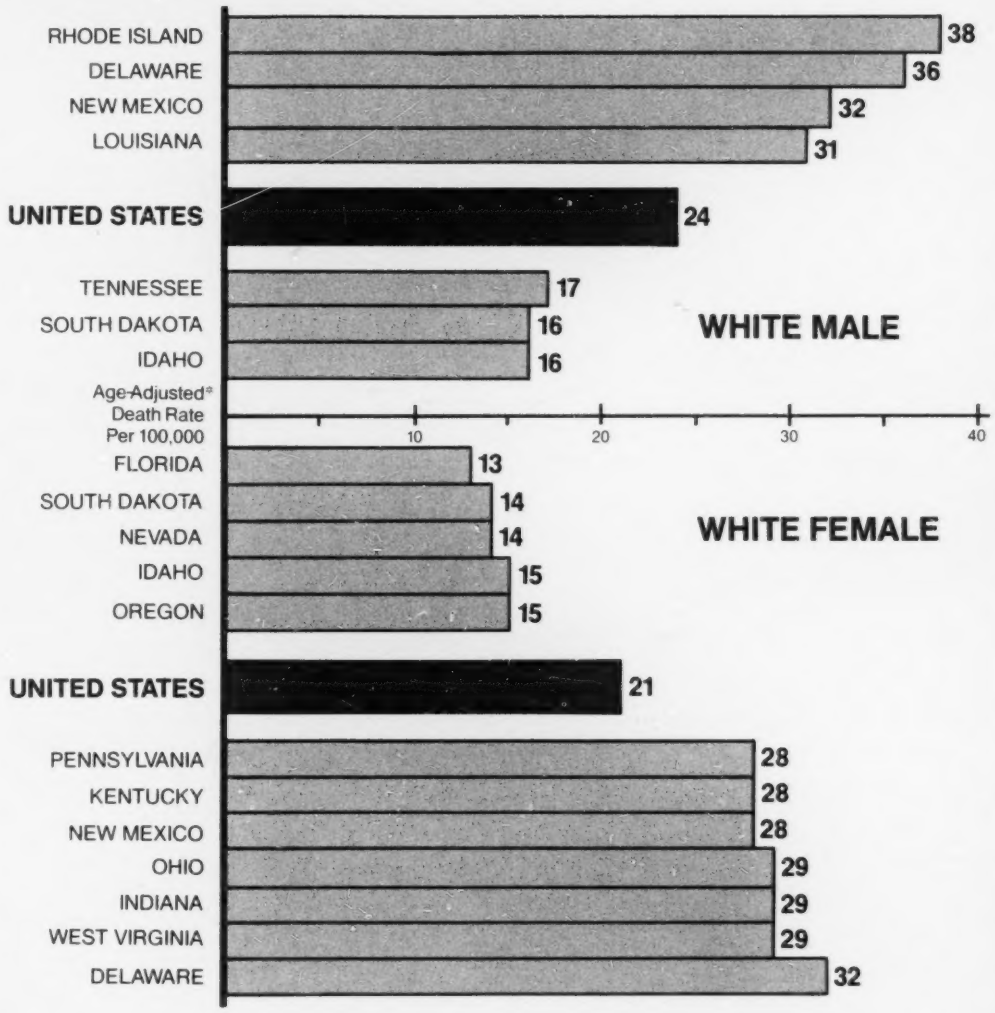


David Johnson

Each of the nine geographic divisions experienced a significant reduction in mortality between 1969-71 and 1979-81.

Each of the nine geographic divisions of the United States experienced a significant reduction in mortality from diabetes between 1969-71 and 1979-81. An analysis of age-adjusted death rates for the white population reveals that, for males, the decrease ranged from 17 percent in the West South Central and Middle Atlantic divisions to 28 percent in the West North Central and East South Central divisions. Among females the relative declines were more pronounced, varying from 22 percent in the Pacific area to as high as 44 percent in the New England division of the country.

States With Highest and Lowest Mortality From Diabetes White Population Aged 45-74, by Sex United States, 1979-81



*Adjusted on basis of age distribution of the United States total population, 1940.

In 1979-81, mortality from diabetes in the white population was higher among males than among females in every geographic division of the country with the exception of the East South Central division, where the rates were the same. For men aged 45-74, the age-adjusted death rate was highest in the Middle Atlantic division and lowest in the Pacific states—the death rates being 29 and 19 per 100,000, respectively. These mortality rates represent a regional disparity of over 50 percent

States with high mortality rates from diabetes in 1979-81 were in the same relative position a decade earlier.

Table 1—Age-Adjusted Mortality Rate From Diabetes White Males Aged 45-74
United States, 1969-71 and 1979-81

Geographic Division*	Death Rate per 100,000 1969-71	1979-81
Pacific	25	19
Mountain	26	20
West North Central	29	21
East South Central	29	21
South Atlantic	30	22
West South Central	29	24
UNITED STATES	32	24
New England	34	26
East North Central	38	28
Middle Atlantic	35	29

*In 1979-81 rank order. See Tables 3 and 4 for states that make up the geographic divisions.

Table 2—Age-Adjusted Mortality Rate From Diabetes White Females Aged 45-74
United States, 1969-71 and 1979-81

Geographic Division*	Death Rate per 100,000 1969-71	1979-81
New England	32	18
West North Central	30	18
South Atlantic	27	18
Pacific	23	18
Mountain	27	19
East South Central	30	21
UNITED STATES	31	21
West South Central	32	22
Middle Atlantic	35	24
East North Central	38	26

*In 1979-81 rank order. See Tables 3 and 4 for states that make up the geographic divisions.

and is virtually the same relative difference that occurred a decade earlier between the East North Central and Pacific divisions. On the other hand, among women, the geographic mortality differential narrowed appreciably in the past 10 years. In 1969-71 the lowest death rate for diabetes was reported in the Pacific division—23 per 100,000—and the highest was experienced in the states that comprised the East North Central division—38 per 100,000—or nearly two-thirds greater. By 1979-81 the relative differential decreased to just two-fifths, with the highest mortality still occurring in the East North Central division and the lowest rate—18 per 100,000—now being recorded in four separate divisions of the country. Particulars of the divisional mortality analysis are presented in Tables 1 and 2.

State Variations

Among individual states in 1979-81, the age-adjusted mortality rate from diabetes among white males in Rhode Island (38 per 100,000) was more than twice the death rate in South Dakota and Idaho (16 per 100,000). Compared with the national average (24 per 100,000), death rates were more than 25 percent higher in Delaware, New Mexico and Louisiana, while in Tennessee the mortality rate was significantly lower. The figure on page 4 graphically presents the preceding data as well as the results for women. For white women aged 45-74, the death rate was highest in Delaware—32 per 100,000. In addition, in six other states (Ohio, Indiana, West Virginia, Pennsylvania, Kentucky and New Mexico), mortality rates from diabetes were at least 25 percent above the average for the nation as a whole. On the other hand, rates of this magnitude below the countrywide figure were experienced in Oregon, Idaho, Nevada, South Dakota and Florida. In fact, women in Florida also had the most favorable record from diabetes in 1969-71.

In 1984 the economic impact of diabetes was estimated to be $13¾ billion.

For the most part, states with high mortality rates from diabetes in 1979-81 also were in the same relative position a decade earlier. Thus, white males in Rhode Island, Delaware, Louisiana, Ohio and Michigan reported mortality rates significantly above the national average, while among white females the states in the unfavorable category included Delaware, Ohio, Pennsylvania, Michigan and Rhode Island. It should be mentioned that in some of these states, as well as a number of other states, substantial mortality reductions were experienced between 1969-71 and 1979-81.

As a result of the impressive mortality reductions in the past decade, especially among white females, in 1979-81 only a handful of states reported higher death rates from diabetes among females than among males. A decade earlier, female death rates were higher in 25 states. Currently, only West Virginia, Kentucky, Tennessee, Wyoming, Colorado and Utah reported death rates for which males had a mortality advantage and in most instances it was very small. In North Dakota and Oklahoma the death rate was the same for each sex.

Age-Specific Data

For all intents and purposes, mortality from diabetes is concentrated at the older ages. For the specific age groups examined in this study, death rates in the United States at ages 65-74 were about seven times the rate at ages 45-54. At ages 45-54 for both white men and women mortality from diabetes was less than 10 per 100,000. Rates in the low to middle twenties were experienced at ages 55-64—less than two-fifths the rate at ages 65-74.

During 1979-81 the highest mortality rate from diabetes among white men aged 65-74 was recorded in the Middle Atlantic states, closely followed by the East North Central states—74 and 73 per 100,000, respectively. The lowest death rate occurred in the West North Central area of the country—46 per 100,000. Mortality from diabetes ranged from a low of 32 deaths

Table 3—Regional Trend in Mortality From Diabetes White Males Aged 45-74, United States, 1969-71 and 1979-81

Area	Death Rate per 100,000								Percent Decrease 1969-71 to 1979-81			
	1969-71				1979-81							
	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74
United States	32	11	32	81	24	9	25	60	25	18	22	26
New England	34	14	33	88	26	10	27	62	24	29	18	30
Maine	29	†	28	73	23	†	24	59	21	‡	14	19
New Hampshire	36	†	31	106	28	†	30	73	22	‡	3	31
Vermont	36	†	†	92	19	†	†	47	47	‡	‡	49
Massachusetts	35	14	34	86	27	12	29	63	23	14	15	27
Rhode Island	44	18	42	109	38	16	44	81	14	11	+5	26
Connecticut	32	12	30	82	20	7	18	54	38	42	40	34
Middle Atlantic	35	12	35	88	29	10	29	74	17	17	17	16
New York	33	13	33	85	28	10	29	73	15	23	12	14
New Jersey	35	11	37	91	29	10	31	73	17	9	16	20
Pennsylvania	37	13	38	91	29	11	28	76	22	15	26	16
East North Central	38	13	38	100	28	9	28	73	26	31	26	27
Ohio	41	13	40	110	30	9	29	83	27	31	28	25
Indiana	37	12	37	99	30	9	34	75	19	25	8	24
Illinois	31	12	33	74	27	9	27	71	13	25	18	4
Michigan	48	16	45	130	27	10	27	69	44	38	40	47
Wisconsin	36	13	36	92	23	8	25	57	36	38	31	38
West North Central	29	10	28	75	21	10	24	46	28	‡	14	39
Minnesota	28	12	24	70	25	10	36	42	11	17	+50	40
Iowa	27	11	27	65	22	11	19	53	19	‡	30	18
Missouri	32	9	34	85	20	7	23	48	38	22	32	44
North Dakota	24	†	†	85	18	†	†	32	25	‡	‡	62
South Dakota	29	†	26	71	16	†	†	†	45	‡	‡	‡
Nebraska	32	13	29	83	20	10	21	41	38	23	28	51
Kansas	26	9	26	68	25	11	24	57	4	+22	8	16
South Atlantic	30	11	32	75	22	9	24	51	27	18	25	32
Delaware	45	†	†	132	36	†	41	85	20	‡	‡	36
Maryland	39	10	38	112	29	11	27	73	26	+10	29	35
District of Columbia	37	†	†	†	†	†	†	†	‡	‡	‡	‡
Virginia	24	8	25	61	20	9	20	48	17	+13	20	21
West Virginia	24	9	26	59	24	8	26	58	‡	11	‡	2
North Carolina	34	13	34	85	25	10	30	53	26	23	12	38
South Carolina	43	14	45	113	26	10	27	61	40	29	40	46
Georgia	34	13	35	83	21	8	22	51	38	38	37	39
Florida	26	9	29	60	18	7	21	43	31	22	28	28
East South Central	29	10	30	74	21	9	21	49	28	10	30	34
Kentucky	33	11	38	82	26	10	26	63	21	9	32	23
Tennessee	25	10	25	59	17	9	17	37	32	10	32	37
Alabama	29	8	28	79	22	8	22	56	24	‡	21	29
Mississippi	30	13	25	79	21	†	19	42	30	‡	24	47
West South Central	29	11	29	72	24	9	24	61	17	18	17	15
Arkansas	25	12	21	62	18	8	19	43	28	33	10	31
Louisiana	39	14	38	101	31	10	30	82	21	29	21	19
Oklahoma	28	10	26	73	20	8	19	49	29	20	27	33
Texas	28	11	29	67	25	9	25	63	11	18	14	6
Mountain	26	10	24	70	20	8	20	48	23	20	17	31
Montana	29	†	32	70	18	†	†	37	38	‡	‡	47
Idaho	27	†	24	69	16	†	†	38	41	‡	‡	45
Wyoming	20	†	†	†	18	†	†	†	10	‡	‡	‡
Colorado	19	†	17	54	18	6	18	45	5	‡	+6	17
New Mexico	31	18	25	72	32	16	33	67	+3	11	+32	7
Arizona	28	13	24	71	20	8	20	48	29	38	17	32
Utah	34	†	31	93	19	†	22	47	44	‡	29	49
Nevada	32	†	†	98	19	†	†	48	41	‡	‡	51
Pacific	25	9	24	65	19	7	19	50	24	22	21	23
Washington	30	13	28	77	21	6	20	56	30	54	29	27
Oregon	23	7	24	58	18	6	20	43	22	14	17	26
California	24	8	24	63	19	7	19	49	21	13	21	22
Alaska	†	†	†	†	†	†	†	†	‡	‡	‡	‡
Hawaii	32	†	†	†	21	†	†	†	34	‡	‡	‡

*Adjusted on basis of age distribution of the United States total population, 1940.
†Fewer than 20 deaths; rate not computed.
‡Not applicable.
Source: Computed by the Health and Safety Education Division of the Metropolitan Life Insurance Company, based on data from the Division of Vital Statistics, National Center for Health Statistics.

Table 4—Regional Trend in Mortality From Diabetes White Females Aged 45-74, United States, 1969-71 and 1979-81

Area	Death Rate per 100,000								Percent Decrease 1969-71 to 1979-81			
	1969-71				1979-81							
	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74	Ages 45-74*	Ages 45-54	Ages 55-64	Ages 65-74
United States	31	9	30	88	21	7	21	56	32	22	30	36
New England	32	9	31	90	18	5	17	52	44	44	45	42
Maine	35	†	33	95	16	†	16	44	54	‡	52	54
New Hampshire	42	18	52	87	19	†	20	55	55	‡	62	37
Vermont	28	†	34	50	18	†	†	55	36	‡	‡	10
Massachusetts	31	8	30	87	18	4	17	54	42	50	43	38
Rhode Island	47	11	35	153	24	†	21	61	49	‡	40	60
Connecticut	28	7	27	79	16	5	15	47	43	29	44	41
Middle Atlantic	35	10	32	103	24	8	24	65	31	20	25	37
New York	31	9	28	90	22	7	21	57	29	22	25	37
New Jersey	36	9	32	107	23	9	21	62	36	‡	34	42
Pennsylvania	42	11	39	122	28	8	28	78	33	27	28	36
East North Central	38	11	34	109	26	8	25	69	32	27	26	37
Ohio	42	12	38	121	29	9	28	79	31	25	26	35
Indiana	39	11	37	108	29	9	28	81	26	18	24	25
Illinois	31	11	28	84	23	8	24	58	26	27	14	31
Michigan	45	12	35	142	25	7	23	70	44	42	34	51
Wisconsin	33	9	31	91	21	8	22	54	36	11	29	41
West North Central	30	9	29	81	18	6	18	48	40	33	38	41
Minnesota	25	8	22	69	16	5	17	43	36	38	23	38
Iowa	29	9	25	83	19	7	17	48	34	22	32	42
Missouri	36	11	37	93	18	4	20	50	50	64	46	46
North Dakota	28	†	30	85	18	†	†	54	36	‡	‡	36
South Dakota	26	†	33	55	14	†	†	44	46	‡	‡	20
Nebraska	27	9	24	73	19	10	16	47	30	-11	33	36
Kansas	30	9	28	86	20	7	21	50	33	22	25	42
South Atlantic	27	8	27	72	18	6	18	46	33	25	33	36
Delaware	58	†	61	165	32	†	27	106	45	‡	56	36
Maryland	41	10	36	123	24	8	21	67	41	20	42	46
District of Columbia	21	†	†	48	†	†	†	†	‡	‡	‡	‡
Virginia	22	6	21	65	16	6	18	40	27	‡	14	38
West Virginia	37	13	39	90	29	8	30	76	22	38	23	16
North Carolina	29	8	29	77	18	5	20	49	38	38	31	36
South Carolina	36	10	35	101	23	6	25	59	36	40	29	42
Georgia	28	10	29	70	18	5	17	54	36	50	41	23
Florida	18	6	19	47	13	5	14	32	28	17	26	32
East South Central	30	8	30	83	21	6	21	57	30	25	30	31
Kentucky	35	9	36	98	28	8	28	76	20	11	22	22
Tennessee	27	8	28	74	18	5	20	47	33	38	29	36
Alabama	29	6	27	87	20	4	21	56	31	33	22	36
Mississippi	27	10	27	69	17	†	14	48	37	‡	48	30
West South Central	32	10	31	86	22	7	22	59	31	30	29	31
Arkansas	27	†	29	78	17	†	16	49	37	‡	45	37
Louisiana	40	12	40	109	26	7	25	74	35	42	38	32
Oklahoma	24	7	22	67	20	7	20	51	17	‡	9	24
Texas	33	11	32	88	23	8	24	60	30	27	25	32
Mountain	27	7	26	75	19	8	17	49	30	-14	35	35
Montana	21	†	†	62	16	†	†	46	24	‡	‡	26
Idaho	29	†	28	82	15	†	†	37	48	‡	‡	55
Wyoming	23	†	†	†	19	†	†	64	17	‡	‡	‡
Colorado	24	7	21	72	21	10	18	50	13	-43	14	31
New Mexico	37	†	42	98	28	13	26	64	24	‡	38	35
Arizona	21	†	27	50	17	6	16	45	19	‡	41	10
Utah	33	†	29	111	23	†	21	61	30	‡	28	45
Nevada	33	†	†	116	14	†	†	33	58	‡	‡	72
Pacific	23	7	22	62	18	7	18	44	22	‡	18	29
Washington	28	10	25	75	20	9	19	51	29	10	24	32
Oregon	22	7	23	56	15	7	14	39	32	‡	39	30
California	22	6	21	60	17	6	19	43	23	‡	10	28
Alaska	†	†	†	†	†	†	†	†	‡	‡	‡	‡
Hawaii	38	†	†	†	†	†	†	†	‡	‡	‡	‡

*Adjusted on basis of age distribution of the United States total population, 1940.
†Fewer than 20 deaths; rate not computed.
‡Not applicable.
Source: Computed by the Health and Safety Education Division of the Metropolitan Life Insurance Company, based on data from the Division of Vital Statistics, National Center for Health Statistics.

per 100,000 in North Dakota to a high of 85 per 100,000 in Delaware. The analysis of mortality of white women at these ages revealed that the death rate was lowest in the Pacific states—44 per 100,000—and was highest in the East North Central division—69 per 100,000. On an individual state basis, the rates varied from as little as 32 per 100,000 in Florida to 106 per 100,000 in Delaware, or more than three times as large. White males aged 55-64 still maintained a mortality advantage over their female counterparts in West Virginia, Kentucky, Tennessee and Oklahoma. For persons 10 years older, there were 20

Death rates from diabetes in the United States at ages 65-74 were about seven times the rate at ages 45-54.

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states in which the mortality differential favored males. However, with the passing of time these instances have diminished.[3] Complete details of the mortality rates by geographic area are shown in Tables 3 and 4.

No Easy Explanations

Various explanations have been offered to account for the regional differences in mortality from diabetes. These include variations in diagnostic and coding procedures as well as fluctuations in the quality of medical care. However, no definite reasons for the disparities have been documented.

Diabetes remains an enigma. It is a disease in which considerable progress has been made in treatment and survival. However, these same successes have increased the number of persons suffering from its complications. In addition, advances in diagnostic procedures have identified many cases at an earlier disease stage than previously. Thus, the combination of these two factors has increased the burden on the health care system. In 1984 the economic impact of diabetes in the United States was estimated to be 13¾ billion dollars.[4] This cost has steadily increased since 1969 when estimates were first made.[5] Hopefully, medical research will add to our knowledge and treatment; meantime, diabetes remains a major public health problem. □

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Commentary
The Death Rate Decline for Diabetes

Mortality statistics are important when assessing any disease's national impact. Politicians use them to justify government health budgets. Special interest groups (e.g., cancer, heart) use them to convince the public that a particular disease has great impact. The media often mention how many lives are "lost" from a particular disease or how it ranks as a leading "killer." Thus, the decline in deaths coded to diabetes as the underlying cause, as documented in the accompanying article "Diabetes Mortality Sharply Declined in Past Decade," on page 2, might seem disconcerting to many actively working in the field of diabetes. Instead, let us consider it a provocative development.

The article presents details of the decline that are based on death certificates filed in the United States during the periods 1969-71 and 1979-81.

There was a 32 percent (females) and 25 percent (males) decrease in the age-standardized rate of diabetes deaths occurring at ages 45-74 years, an age range in which 55 percent of deaths coded to diabetes occur.

The decline is impressive: in just one decade there was a 32 percent (females) and 25 percent (males) decrease in the age-standardized rate of diabetes deaths occurring at ages 45-74, an age range in which about 55 percent of deaths coded to diabetes occur. (For all causes of death, an 18 percent decline in the death rate at all ages occurred during the same decade.) In addition, the decline occurred at a time when the death rate from diabetes could be expected to rise because of a significant increase in diabetes prevalence.

During the 1960s, there was a rapid rise in new diagnoses of diabetes, probably because of active screening. Concomitantly, diabetes prevalence rose from 0.9 percent in 1960 to 1.8 percent in 1970; in 1980 it was about 2.5 percent. Those newly discovered cases of the 1960s were as much as 20 years older by 1979-81 and should have begun to experience mortality, thus increasing the diabetes death rate. Instead, a decline occurred.

Two Likely Explanations

The decline may be explained two ways. One is that it is artifactual because of changes in the death certification process, i.e., persons who fill out death certificates may be less likely to list diabetes where it would be selected as the underlying cause of death. The second is that biological/clinical phenomena have occurred during the decade, so that diabetics are surviving longer. It is likely that both explanations contribute to the observed decline.

Sufficient data do not exist to determine whether there has been a systematic decrease in listing diabetes on death certificates of diabetics. However, there is documentation of a decrease from 28.5 percent (1968) to 25.9 percent (1978) of certificates that list diabetes in which it is the underlying cause of death. This constitutes a 9 percent decline, and thus could account for about one-fourth of the decline experienced from 1969-71 to 1979-81.

The majority of death certificates listing diabetes also list a cardiovascular condition, whether diabetes is or is not selected as the underlying cause of death. For example, among deaths at ages 35 years and older, about 60 percent of diabetes underlying-cause deaths involve ischemic heart disease and 25 percent involve cerebrovascular disease. The decline in mortality from heart diseases has been well-documented, and it is likely that diabetics are benefiting from factors causing this general decline in the United States as a whole. Some of these factors are: decreases in hypertension, cigarette smoking, obesity and cholesterol, as well as improved coronary heart disease care, including emergency resuscitation and specialized hospital care; more physical exercise and better nutrition; and better general health, which might result from higher socioeconomic status. These factors are all likely contributors to the improved outcomes for diabetics with cardiovascular problems. Between 1970 and 1980, the age-adjusted death rate from cardiovascular diseases declined 26 percent, which could account for the other three-fourths of the decline in the diabetes death rate.

Between 1970 and 1980, the age-adjusted death rate from cardiovascular diseases declined 26 percent, which could account for the other three-fourths of the decline in the diabetes death rate.

No Clear Regional Patterns

There is no clear regional pattern to the decline. Some states with high rates had large declines, but states with rates lower than the national average in 1969-71 also had large declines. For white females in 1969-71, the 45-74 years age-standardized rate was higher than the national rate in 21 states; in 1979-81, 15 of these states were still above the national average rate. For white males a similar phenomenon occurred; 20 states were higher than the U.S. in 1969-71 and 15 of these were still higher a decade later.

Interestingly, many of these high-rate states are clustered together, in a broad band from Massachusetts in the north and Maryland in the south, west to Wisconsin and including states bordering the Great Lakes and their neighbors Kentucky and West Virginia. A second high-rate area is formed by North and South Carolina and Georgia. Louisiana and Utah constitute isolated high-rate spots. States in the West region tended to have the lowest rates in both time periods. It is unknown why such regional patterns occurred.

While the decline in the diabetes death rate is a welcome public health phenomenon, and hopefully one that will continue, the reasons for it remain obscure. Were they known, they might indicate directions for new preventive interventions applicable to all persons with diabetes. □

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Differences in Breast and Lung Cancer Mortality in the United States

Cancer, the second leading cause of death in the United States, will account for an estimated 462,000 deaths throughout the nation in 1985.[1] Cancer death rates vary by site, age and sex, as well as by geography. Nonetheless, lung cancer has been the No. 1 cause of cancer deaths for American males since the mid-1960s, while breast cancer has been the leading cause of female cancer mortality for almost 40 years. Current data, however, are indicating a shift in the historic positions breast and lung cancer have held among U.S. women.

The preceding issue of the *Statistical Bulletin* presented ominous data showing that lung cancer death rates will shortly exceed those for breast cancer among women 35-84 for the first time in American history.[2] Since World War II, the climb in female lung cancer death rates has been explosive while breast cancer death rates advanced only slightly. In this article, we compare 1979-81 breast and lung cancer death rates for white women, 35-74, on a state-by-state basis in the continental United States and including the District of Columbia. (Alaska and Hawaii have been excluded from this study because the small number of deaths precluded meaningful analysis.) This is the second in the new series to present regional statistics based on the 1980 population census and deaths that occurred in 1979, 1980 and 1981.

Breast cancer rates are those deaths assigned to International Classification of Diseases, Ninth Revision, Codes 174 and 175; the lung cancer rates include Codes 160-165, cancers of the respiratory and intrathoracic organs, over 95 percent of which are malignant neoplasms of the lung, trachea and bronchus. For purposes of this analysis, the diseases included in these codes will be referred to as lung cancer. Mortality rates are shown per 100,000 population in 10-year age groupings between 35 and 74 and for the ages 35-74 combined. The combined death rates have been age-adjusted because of differences in the age composition of state populations.

Breast Cancer

As shown in the accompanying table and Figure A, the 1979-81 breast cancer mortality rates among white women 35-74 varied considerably between regions of the country. Four of the nine geographic areas recorded rates above the average United States total of 51.5 per 100,000. The highest mortality was registered in the Middle Atlantic states (59.0 per 100,000), followed by the New England states (55.4). Respectively, these rates were 15 and 8 percent above the national rates. The lowest rate—42.7 per 100,000—was found in the East South Central area and was 17 percent below the U.S. total. The West South Central area recorded the second lowest breast cancer death rate, 16 percent below the total.

Mortality rates increased with age; the rate of increase was the greatest between the 35-44 and 45-54 age groups, where the rates almost tripled. The rate of increase slowed with each succeeding age category thereafter, with no apparent significant regional differences. The highest mortality was reported in the Middle Atlantic states in each age group and the lowest was seen in the East South Central area for all women and those aged 35-44 and 65-74. The West South Central states registered the lowest rates among white women between 45-54 and 55-64.

Variations in breast cancer death rates were more pronounced between individual states than between regions.

Variations in breast cancer death rates were more pronounced between individual states than between regions of the country. The

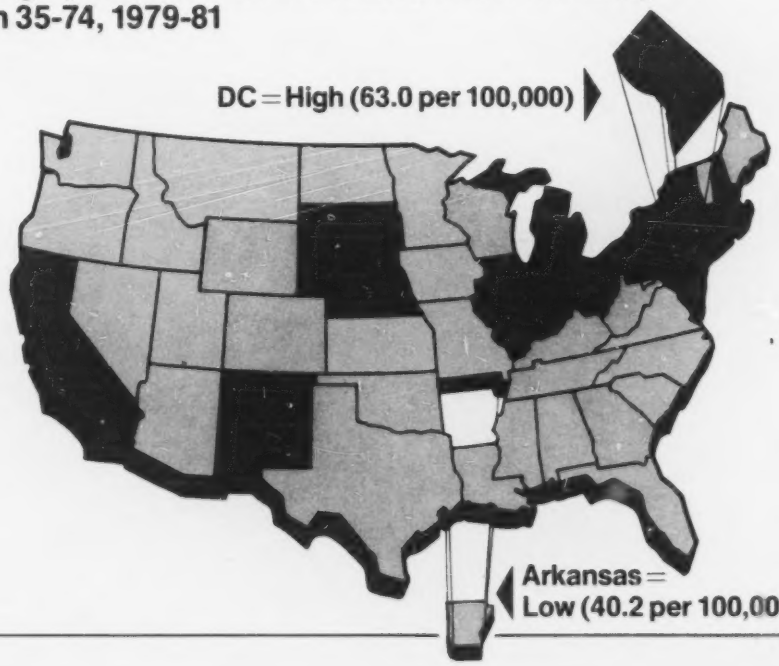
highest breast cancer mortality rate among white women 35-74 years old was recorded in the District of Columbia and the lowest rate was recorded in Arkansas. There was a 57 percent difference between these high and low mortality rates; both rates differed by 22 percent from the national total.

Three other states registered death rates 15 percent or more above the U.S. average. New York, Delaware and New Jersey had the second, third and fourth highest breast cancer mortality during the period, with rates in excess of 60 per 100,000. Eight states recorded death rates 15 percent or more below the U.S. total for women 35-74. Texas had the eighth lowest mortality rate—43.5 deaths per 100,000—followed by West Virginia, Alabama and Mississippi with identical rates of 42.9 per 100,000, Louisiana, Georgia, Tennessee and finally Arkansas.

Substantial between-state variation was evident within the various age groups. South Dakota registered the highest rate among white women 35-44 (32.9)—a rate 86 percent above that for all women in this age group. Wyoming (data not shown) and Oregon registered the lowest breast cancer mortality among these women with rates of at least 33 percent below that for all American women 35-44.

Among white women 45-54, the highest mortality occurred in Delaware, with a rate almost 50 percent above the U.S. total. Vermont and Nevada registered the lowest rates for these women, 36.0 and 36.4 per 100,000, respectively.

Figure A—Geographic Variation in Breast Cancer Mortality White Women 35-74, 1979-81



Mortality From Breast and Lung Cancer
White Females Aged 35-74, United States, 1979-81

Area	Breast Cancer Death Rate per 100,000					Lung Cancer Death Rate per 100,000				
	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74	Ages 35-74*	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65-74
United States	51.5	17.7	49.2	80.9	105.2	42.0	6.8	34.0	75.2	107.6
New England	55.4	18.0	51.8	90.0	114.5	43.4	8.1	35.0	77.4	109.3
Maine	50.5	15.4	50.8	76.6	107.7	42.7	†	31.0	81.9	109.8
New Hampshire	52.5	19.1	42.0	99.4	96.2	46.3	†	41.3	77.6	110.5
Vermont	47.9	†	36.0	79.5	111.3	41.3	†	†	78.1	114.9
Massachusetts	57.7	18.3	53.7	93.5	121.1	42.7	7.8	35.8	75.2	106.2
Rhode Island	55.3	22.9	57.8	80.1	101.0	44.7	†	37.4	77.1	101.0
Connecticut	55.0	16.7	52.0	90.2	114.4	44.2	7.7	33.4	79.7	116.9
Middle Atlantic	59.0	19.9	56.7	92.3	122.2	42.0	7.4	32.7	72.5	113.2
New York	62.3	21.8	59.2	98.2	126.8	43.3	7.8	33.8	74.5	117.0
New Jersey	60.2	18.4	59.2	93.2	128.0	44.8	8.5	34.5	77.2	120.2
Pennsylvania	54.2	18.3	51.9	84.4	112.8	38.6	6.2	30.1	67.4	104.4
East North Central	53.7	18.0	50.7	84.2	113.3	40.9	6.4	34.0	72.3	104.7
Ohio	56.9	19.2	54.0	90.1	117.0	43.9	6.4	36.1	77.6	114.8
Indiana	51.6	18.9	48.1	80.7	105.6	42.3	6.3	33.7	78.8	106.3
Illinois	54.1	17.1	50.4	83.2	121.2	40.7	6.7	33.9	72.0	103.4
Michigan	52.0	18.1	50.3	81.0	105.2	41.9	6.3	35.0	75.5	105.4
Wisconsin	51.0	16.0	47.0	82.6	108.8	31.1	6.1	28.1	47.1	83.6
West North Central	48.7	17.0	47.5	73.1	102.1	33.8	5.9	29.0	60.8	81.3
Minnesota	48.8	16.8	47.2	71.1	107.6	29.8	5.0	23.8	53.9	76.1
Iowa	47.1	15.6	40.2	76.8	105.3	29.7	5.8	24.5	55.7	68.2
Missouri	48.7	17.3	50.2	74.7	92.1	41.4	6.2	33.7	77.4	101.4
North Dakota	46.8	†	42.5	69.2	103.4	20.4	†	†	31.7	59.1
South Dakota	56.0	32.9	52.2	75.0	99.9	30.8	†	34.1	46.5	63.7
Nebraska	53.8	16.2	58.0	73.7	118.4	30.7	†	31.7	46.5	75.5
Kansas	45.6	14.6	44.4	68.5	100.0	36.3	8.3	33.0	64.6	77.9
South Atlantic	47.0	16.8	46.2	72.3	93.6	42.7	6.5	34.7	79.4	105.2
Delaware	61.0	†	71.9	81.1	113.4	52.5	†	33.6	93.4	155.4
Maryland	56.1	23.0	53.7	86.5	107.1	48.9	6.0	36.4	91.8	131.9
District of Columbia	63.0	†	†	105.0	172.5	54.6	†	†	101.5	159.5
Virginia	47.9	17.2	48.4	72.3	94.1	44.2	7.1	33.3	78.6	120.4
West Virginia	43.4	13.5	39.7	69.5	94.8	43.9	†	38.0	87.1	97.7
North Carolina	45.4	17.8	44.8	68.5	88.3	33.3	5.6	30.8	61.6	72.5
South Carolina	45.5	15.0	39.1	76.4	97.6	37.2	†	31.6	71.7	86.8
Georgia	41.1	14.9	40.5	63.6	80.9	35.3	4.4	30.6	70.1	77.5
Florida	46.4	15.1	47.4	71.1	92.9	47.3	8.6	39.1	85.7	114.6
East South Central	42.7	15.7	43.1	67.4	78.7	39.5	7.5	36.5	69.7	89.1
Kentucky	44.9	15.2	48.1	69.3	82.0	46.9	10.4	46.0	78.6	101.6
Tennessee	40.8	14.0	38.7	69.4	75.3	36.7	6.8	31.4	70.1	80.4
Alabama	42.9	17.4	44.9	64.2	75.8	36.3	7.5	34.2	63.1	80.0
Mississippi	42.9	17.4	41.0	64.8	84.9	37.6	†	34.1	62.8	101.2
West South Central	43.1	16.2	41.7	66.8	84.2	41.3	5.8	33.8	75.6	105.1
Arkansas	40.2	15.7	40.3	61.1	76.1	36.6	†	28.8	68.7	93.3
Louisiana	42.2	14.9	41.5	65.4	83.6	44.6	6.8	34.6	81.3	116.9
Oklahoma	44.4	15.3	41.9	71.5	89.2	40.8	7.1	34.1	75.4	97.0
Texas	43.5	16.8	41.9	67.1	84.7	41.6	5.3	34.4	75.5	107.0
Mountain	47.4	16.2	44.6	76.5	95.6	35.9	4.5	27.0	67.5	95.4
Montana	48.1	18.5	47.2	74.0	92.8	35.1	†	29.3	58.8	101.6
Idaho	45.3	14.1	42.0	73.7	95.8	28.8	†	17.6	63.8	69.0
Wyoming	50.0	†	48.0	99.1	85.8	36.9	†	†	85.2	91.3
Colorado	44.0	13.7	40.7	70.6	95.3	30.8	†	26.4	52.9	84.7
New Mexico	51.6	25.4	48.1	70.4	104.5	32.4	†	25.0	56.5	94.9
Arizona	50.2	17.0	49.9	83.3	91.6	45.3	7.6	33.0	88.0	112.8
Utah	46.6	14.6	43.8	71.8	103.6	18.7	†	†	34.9	55.9
Nevada	45.8	16.4	36.4	80.0	96.6	58.1	†	48.9	104.8	148.6
Pacific	54.7	18.8	50.2	88.1	113.5	51.4	8.2	39.4	91.0	139.4
Washington	49.1	17.6	40.4	86.8	98.0	50.6	6.6	40.8	86.9	140.6
Oregon	46.0	11.8	40.8	77.3	105.0	49.5	8.6	43.3	88.4	117.6
California	57.0	20.2	53.3	90.1	117.1	52.0	8.5	39.1	92.0	141.8

*Adjusted on the basis of age distribution of United States total population, 1940.

†Fewer than 20 deaths; rate not computed.

Note: Alaska and Hawaii are excluded. See text on page 12.

Source: Basic data from the Division of Vital Statistics, National Center for Health Statistics.

The highest mortality rates for women 55-64 and 65-74— 105.0 and 172.5 per 100,000, respectively—were found in the District of Columbia. New Hampshire, Wyoming and New York each reported more than 98 deaths per 100,000 for women 55-64; New Jersey, New York, Illinois and Massachusetts reported deaths in excess of 120 per 100,000 for women 65-74. The lowest breast cancer mortality rate for white women 55-64 was reported in Arkansas, where 61.1 deaths per 100,000 were reported. Alabama and Tennessee registered the lowest mortality among the women aged 65-74.

Lung Cancer

The geographic distribution of lung cancer mortality rate differed from those for breast cancer. The Pacific area of the country recorded the highest rate (51.4 per 100,000), 22 percent above the average. The West North Central area recorded the lowest lung cancer mortality (33.8 per 100,000), almost 20 percent below the national total. The Pacific rate was more than 50 percent above that for West North Central states. Two other regions, i.e., New England and the South Atlantic, recorded rates higher than the national total.

The mortality rate quintupled between ages 35-44 and 45-54; more than doubled between the 45-54 and 55-64 year-old groups; and increased by 1.4 percent between the 55-64 and 65-74 age groups. Relatively minor regional variation in the amount of increase between age groups was evident across the country.

Lung cancer mortality was highest in the Pacific area for each of the four age groups presented, and lowest in the Mountain states for the women ages 35-44 and 45-54. For the oldest groups of women, the West North Central area recorded the lowest lung cancer mortality with a rate of 60.8 for women 55-64 and a rate of 81.3 per 100,000 for women 65-74.

As seen in Figure B, Nevada registered the highest lung cancer mortality (58.1 per 100,000 population) among white women 35-74. The District of Columbia recorded the second highest among these women, followed by Delaware, California and Washington, each registering rates above 50 per 100,000 population. Not surprisingly, Utah with its large Mormon population, registered the lowest female lung cancer mortality of all the states/districts studied. The Utah death rate (18.7 per 100,000) was 55 percent below the national total for women between 35 and 74, 8 percent below the second lowest rate reported in North Dakota, and 68 percent below the Nevada high. Idaho, Iowa and Minnesota each recorded mortality rates under 30 per 100,000.

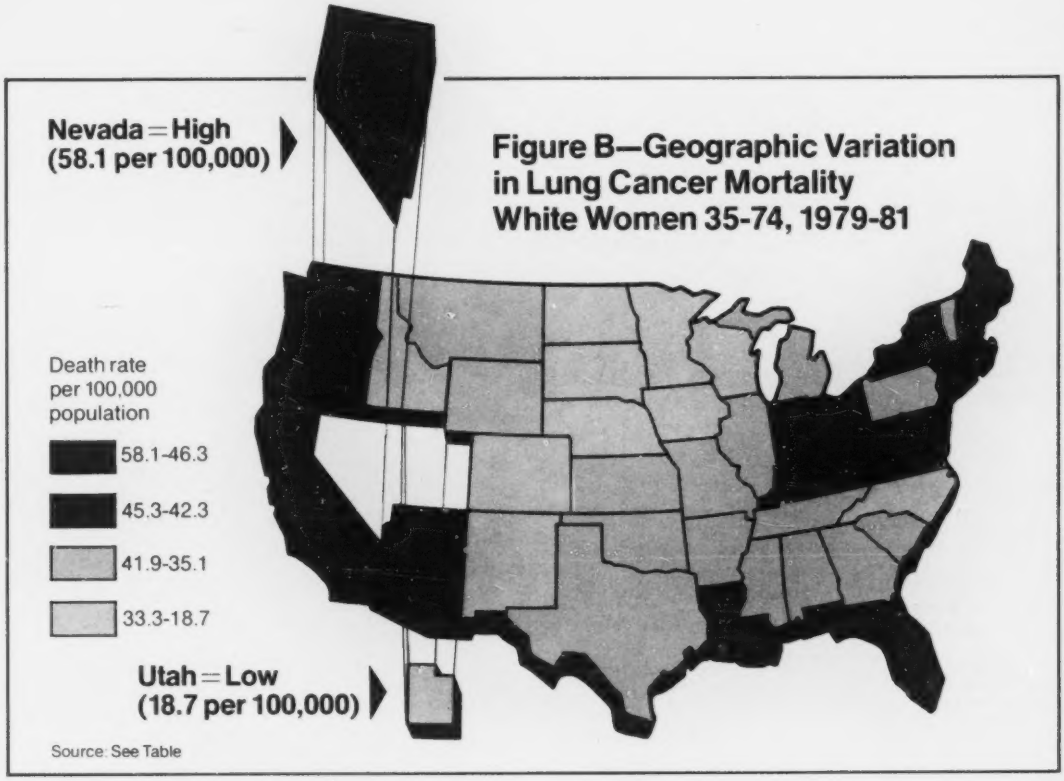
For women 55-64, lung cancer mortality was highest in Nevada (104.8 deaths per 100,000) followed by the District of Columbia (101.5). Delaware, California and Maryland with rates at least 22 percent above the United States total. North Dakota and Utah were the two states in which the lowest rates were registered for this age group.

Utah, with its large Mormon population, reported the lowest female lung cancer mortality.

Among white women 65-74, the District of Columbia ranked No. 1 in lung cancer mortality with a rate of 159.5—almost 50 percent above the national total for this age group. Delaware and Nevada ranked second and third with rates of 155.4 and 148.6, respectively; Utah recorded the lowest lung cancer mortality among these women—55.9 deaths per 100,000, almost 50 percent below the total. North Dakota, South Dakota, Iowa and Idaho each recorded rates below 70 per 100,000.

Breast and Lung Cancer

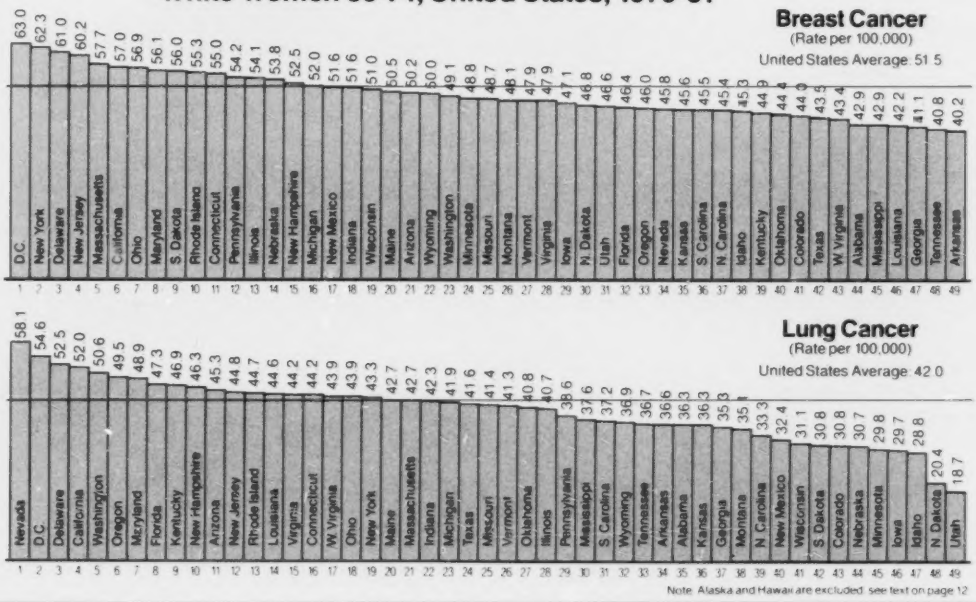
As shown in Figure C, there was a wider range in the female lung cancer mortality rates (18.7



to 58.1 per 100,000) than in the breast cancer rates (40.2 to 63.0 per 100,000). A 211 percent difference existed between the high and low lung cancer rates versus a 57 percent difference between these extreme rates for breast cancer. Twenty-two states registered lung cancer mortality in excess of the age-adjusted rate for the country (42.0 per 100,000) and 18 states recorded breast cancer deaths above the total rate of 51.5 per 100,000 population. Only four of the areas with the 10 highest breast cancer mortality rates were also among the 10 areas with the highest lung cancer rates. Conversely, only one of the 10 states with the lowest breast cancer death rates was among the 10 with the lowest lung cancer mortality.

Total breast cancer rates were 23 percent higher than those for lung cancer. When these data are analyzed by age groups, the results are startling. Breast cancer mortality remains higher through age 64 but drops below that of lung cancer among white women 65-74. Among the youngest group of these women, a 160 percent difference existed between breast and lung cancer mortality, whereas among the oldest group of white women, the difference was a 2 percent drop. Twenty-seven states recorded higher lung than breast cancer mortality among this older group of women. Four of the nine geographic areas (e.g., South Atlantic, East South Central, West South Central and Pacific) registered higher lung cancer than breast cancer mortality in *both* the 55-64 and 65-74 age groups. In addition, three states, Washington, Oregon and Nevada, recorded lung cancer rates higher than breast cancer rates among women in three age groups, i.e., 45-54, 55-64 and 65-74.

Figure C—Age-Adjusted Death Rates for Breast Cancer and Lung Cancer White Women 35-74, United States, 1979-81



Note: Alaska and Hawaii are excluded. see text on page 12

Lung Cancer Overtaking Breast Cancer

Recent reports predict that lung cancer death rates will overtake those from breast cancer among women for the first time in American history. The data presented here indicate such a situation was evident between 1979-81 among American women 65-74 and in certain other age groups and areas of the country as well. The geographic distribution of these two diseases suggests environmental and etiologic differences. The low lung cancer rates in Utah women reflect the Mormon proscription of tobacco use. Lung cancer is higher in urban and industrialized areas as well as in areas of traditionally high in-migration. The well-known correlation between urban living and cigarette smoking now appears to include females for the first time.

As women who began smoking during the 1940s continue to age, their lung cancer mortality rate will continue to increase. However, it is unlikely that female lung cancer mortality rates will ever reach those among males because of the differences between the sexes in the smoking habit. Nevertheless, these lung cancer mortality rates for both sexes are unacceptable in this age of preventive medicine, heightened health awareness and consumer responsibility in health care. □

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Capsule Briefs

are timely literature selections with broad reader interest.

Smoking and Fertility

Women who smoked had fertility levels that were only 72 percent of nonsmokers, according to this epidemiologic study conducted by researchers at the National Institute of Environmental Health Sciences. They queried 678 pregnant women about their contraceptive cycles and their smoking histories. Smokers were 3.4 times more likely to have taken more than a year to conceive than nonsmokers. Heavy smokers were less fertile than light smokers. (D.D. Baird and A.J. Wilcox, *JAMA*, 253:2979-2983, 1985.)□

Healthier Hearts

This occupational health research at DuPont Company may help explain whether the recent significant national decline in coronary heart disease (CHD) deaths has resulted from fewer new cases or rather from lower death rates in existing cases. In covering 27 years, the new-case rate declined first, and the case fatality rate went down also, but only after the first trend was well established. In this sizable work force, the authors concluded that the major source of the CHD death rate decline was the reduction in new cases. (S. Pell and W.E. Fayerweather, *New England Journal of Medicine*, 312: 1005-1011, 1985. Also see related editorial 312: 1053-1055.)□

On Montezuma's Revenge

Travelers abroad, particularly to tropical climates and lesser developed countries, who hope for a simple solution to the nagging problem of diarrheal conditions, will take interest in this article. Using the experience of 35 arriving Peace Corps Volunteers (PCV) in Thailand as subjects, it was found that 20 (57 percent) had 30 bouts of diarrhea in their first six weeks in the country. After performing stool exams on each PCV, regardless of symptoms, on days 1, 20, and 39, a total of 10 different enteric pathogens were identified, though in 57 percent of cases a single pathogen was at work. Enterotoxic *Escherichia coli* was present most often—in some 37 percent of the total cases. (Since therapy follows precise diagnosis, sufferers will generally require careful clinical workups before adequate treatment may occur. Ed.) (D. Taylor, *et al*, *Lancet* 1:381-383, 1985.)□

Shrinkage on the Upswing

When Diagnostic Related Groups (DRGs) were made the basis for Medicare's flat-fee type reimbursement formula for hospital care, psychiatric conditions were exempted. This policy, intended to prevent unfair application of the DRG technology to an area of medical care that is difficult to codify for reimbursement, has had inadvertent consequences: admissions to psychiatric hospitals have risen about 25 percent since DRGs were introduced (October, 1983), and charges are projected to rise from $3.0 billion to $7.2 billion by 1988. (It seems time for government officials to go back to the drawing board. Ed.) (R. Teitelman, *Forbes*, p. 174, June 17, 1985.)□

Stress Not a Factor in Children's Blood Pressure

A group of University of Minnesota investigators sought, but could not find, an epidemiological relationship between stress in 1,505 school children aged 6 to 9 (as measured by recent life events) and their blood pressure levels, particularly elevations. This article contains an interesting frequency distribution, however, of the responses of these children's parents to the Life Events Questionnaire—a frequently used research instrument to measure stress in population studies. For example, 10.7 percent had parents who separated in the preceding 12 months. (R.F. Gillum, *et al, Journal of Chronic Disease*, 37:839-851, 1984.)□

Demon Rum and Youth on the Road

Raising the drinking age in Massachusetts from 18 to 20 years in 1979 has apparently reduced the nonfatal auto crashes in 16- and 17-year-olds significantly compared to New York State which had no comparable restriction during the time of the study. No decline in single-vehicle, nighttime fatal crashes was observed, however. The authors conclude that during the study period 1979-81 the changes in drinking behavior in 16- and 17-year-olds was minimal, if one used these auto crash indicators. (Not discussed was the effect of younger legal drinking ages in surrounding states, during the study time period, undoubtedly an important, but unmeasured factor in teenage alcohol accessibility. Ed.) (R.A. Smith, *et al, Journal of Studies on Alcohol*, 45:534-539, 1984.)□

Nuclear Winter Ocean—Atmospheric Effects

Nothing, it seems, is ever simple, even when it is as complex as simulating the tragic effects of multiple, simultaneous nuclear explosions on the earth's atmosphere, causing "nuclear winter" In this letter to the editor, the author poses the effects of these explosions on ocean currents through atmospheric-pollution. He cites evidence from volcanic eruptions indicating that, in addition to the other complications from nuclear devastation, the ocean current changes (e.g., El Nino) would bring unusual warming trends and storminess to affected global regions. (A.E. Strong, *Science*, 228:792, 1985.)□

Cloves as a Risk Factor

Sometimes the best prevention programs occur before an epidemic happens; these two case studies surely prompt that wish. According to the Centers for Disease Control, use of clove cigarettes was reported in 12 cases of severe illnesses—March 1984 to May 1985. This article provides clinical summaries of two adolescent males who smoked clove cigarettes and developed severe, acute chest diseases requiring hospitalization. In each case, it appeared the symptoms resulted from toxic rather than infectious reactions. (If cloves as an additive represent part of a new strategy by tobacco companies to increase their market share, we suspect another cigarette-induced epidemic may be in the making. Ed.) (*Morbidity and Mortality Weekly Report*, 34:297-299, 1985.)□

Mortality from Respiratory Cancer Continues to Rise Internationally

The rising toll of mortality from respiratory cancer, especially among women, is a growing international concern. Between 1976 and 1981 mortality from this cause in the United States and Canada rose significantly among women, whereas the increase among men was much lower. Among men, in most of the industrialized countries of Western Europe periodically studied by the Metropolitan Life Insurance Company, death rates from respiratory cancer declined slightly. However, the death rate in women from cancer of the respiratory system increased in all of the Western European nations. In the United States the number of deaths from respiratory cancer among women is on a par with, or already has exceeded, the mortality toll from breast cancer.[1]

In the United States the number of deaths from respiratory cancer among women is on a par with, or already has exceeded, the mortality toll from breast cancer.

This is the third and last article in the current series of analyses comparing mortality rates from specific causes of death in the United States with those in Canada and selected countries in Western Europe.[2,3] Malignant neoplasms of the respiratory and intrathoracic organs (International Classification of Diseases, Ninth Revision, Codes 160-165) is the group of diseases commonly referred to as respiratory cancer. The codes notwithstanding, the predominant causes of death discussed in this report are malignant neoplasms of the trachea, bronchus and lung—Code 162—which will be referred to as lung cancer. In the United States they represent virtually all of the deaths from the major category. In order to make comparisons valid, death rates for men and women aged 35-74 have been adjusted for the differences in each country's age distribution.

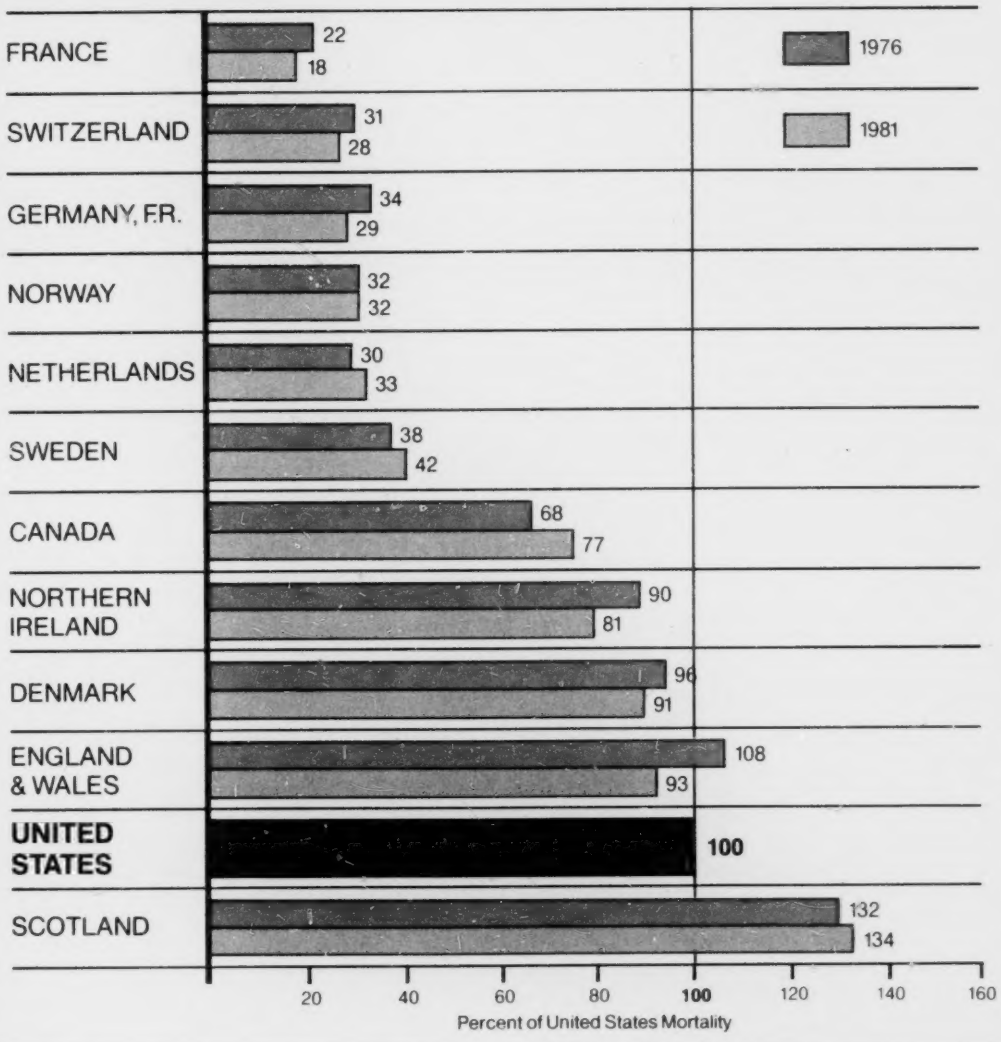
Mortality rates in the United States can be reasonably compared with the weighted average death rate for the group of industrialized countries of Western Europe—United Kingdom, France, Germany and Switzerland. These nations, as an entity, closely resemble the United States in population size, geographic diversity, degree of industrialization, variety of ethnic and cultural stock and range of socioeconomic conditions. However, it is also quite common to compare the mortality rates in the United States with those in individual countries such as Canada, Sweden, Denmark or the Netherlands.

Alarming Rise Among Women

The substantial rise in mortality from lung cancer among women is a cause for alarm. For women 35-74 years old, the age-adjusted death rate in Canada increased by 46 percent between 1976 and 1981, and in the United States the comparable rise was 29 percent. The

The substantial rise in mortality from lung cancer among women is a cause for alarm.

Figure A—Relative Mortality From Cancer of the Trachea, Bronchus and Lung Among Women Aged 35-74 United States Compared With Selected Countries, 1976 and 1981
(In 1981 Rank Order)



increase in mortality during this period was also high in the Scandinavian countries and the Netherlands—namely, 33 percent. Only in the block of other highly industrialized countries of Western Europe was the increase in the death rate relatively small—11 percent. In 1981 the mortality rate from lung cancer among women aged 35-74 was 32 per 100,000 in Canada and was somewhat higher in the United States at 42 per 100,000. The mortality rate in the group of industrialized Western European nations, and in the block of Scandinavian countries and the Netherlands, was only about half the magnitude of the rate in the United States.

The recent trends in mortality from lung cancer have not materially shifted the gap in mortality levels between the United States and the groups of countries for which comparative mortality is analyzed. For instance, the disparity in mortality rates between women in the United States and their contemporaries in the block of highly industrialized Western European countries widened somewhat, but the differences narrowed in Canada and in the group of Scandinavian countries and the Netherlands. Thus, in 1981 the death rate for women residing in Western Europe was just 47 percent of that in the United States, whereas the relative number was 54 in 1976. On the other hand, the ratio of mortality rates rose from 68 to 77 for Canada, and although still markedly lower than for the United States, increased from 43 to 45 in the Scandinavian countries and the Netherlands.

Analysis of lung cancer death rates among individual countries reveals that for women aged 35-74, mortality was highest in Scotland (56 per 100,000) and was exceptionally low in France (8 per 100,000). The low mortality rate reported for France may be an artifact resulting from conflicting international reporting procedures. In Switzerland and the Federal Republic of Germany, the death rate from lung cancer in 1981 was around 12 per 100,000, was not much higher in Norway and the Netherlands, rose to around 18 in Sweden, but then jumped into the 30s for the remainder of the nations not already mentioned.

Age-adjusted Rates Among Women

Figure A is a graphic presentation of the age-adjusted female mortality rates in individual countries compared with the United States. It is evident that women in the United States lost ground to those in France, Switzerland, Germany, Northern Ireland, Denmark, and England and Wales. In Norway, the 1981 mortality rate from lung cancer was 32 percent of that in the United States—the same relative number as in 1976. The increase in the death rate for women in the United States was not as rapid as that for women in the Netherlands, Sweden, Canada and Scotland—resulting in a widening of the mortality differentials. In 1981 Scotland had the dubious distinction of being the only nation in which the death rate from lung cancer was higher than that in the United States—more than 30 percent; in 1976 Scotland and England and Wales were the only countries in this unfavorable category.

In 1981 Scotland was the only nation in which the death rate from lung cancer was higher than that in the United States.

Figure B—Relative Mortality From Cancer of the Trachea, Bronchus and Lung Among Men Aged 35-74 United States Compared With Selected Countries, 1976 and 1981
(In 1981 Rank Order)

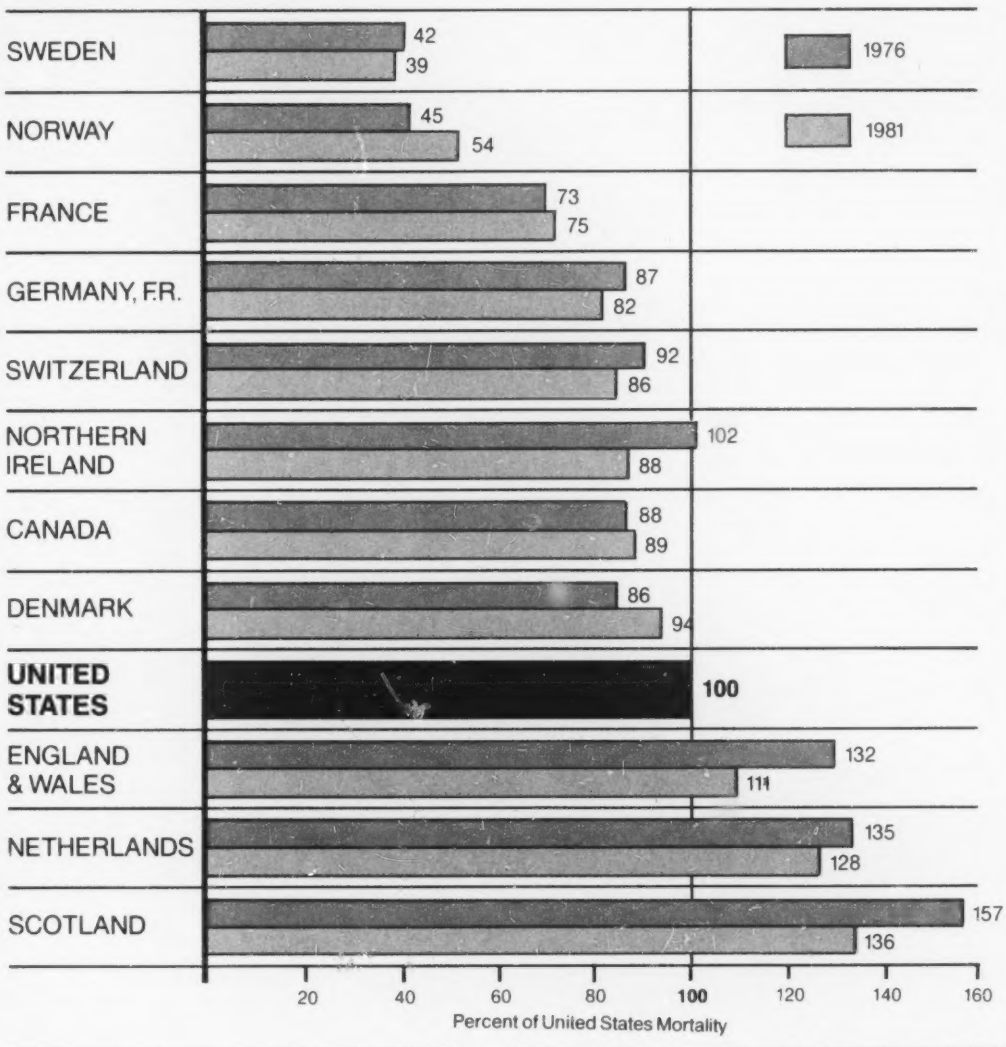


Table 1—Mortality from Cancer of the Trachea, Bronchus and Lung Among Men in Selected Countries—1976 and 1981
Death Rate per 100,000

Country	1976 Ages 35-74*	1976 Ages 35-44	1976 Ages 45-54	1976 Ages 55-64	1976 Ages 65-74	1981 Ages 35-74*	1981 Ages 35-44	1981 Ages 45-54	1981 Ages 55-64	1981 Ages 65-74
United States										
White	113.9	12.8	69.3	198.3	372.8	117.9	10.6	71.2	203.4	398.4
All Other	147.7	21.3	119.7	278.8	362.1	160.5	20.2	116.3	295.9	447.2
Total	117.3	13.8	74.7	205.8	371.8	122.4	11.8	76.4	212.6	403.1
Canada	103.1	8.1	55.8	179.7	364.2	108.7	8.7	57.2	197.0	375.1
Denmark	100.4	3.7	54.9	165.9	380.5	115.0	3.9	49.7	210.4	435.2
Norway	52.5	2.9	32.3	94.2	175.3	65.9	4.5	36.6	108.6	242.9
Sweden	48.9	4.4	22.4	78.4	192.4	47.2	4.2	24.9	79.0	172.5
Netherlands	158.6	9.3	65.0	274.4	623.8	156.6	9.7	62.7	252.8	647.7
Weighted Average	103.2	6.4	47.1	169.4	380.1	106.8	6.6	47.4	173.5	401.2
United Kingdom										
England and Wales	155.3	10.9	74.4	269.6	577.5	135.9	7.6	59.4	233.7	529.0
Northern Ireland	119.5	11.0	55.3	226.2	410.5	107.6	6.8	53.0	188.8	395.7
Scotland	184.1	14.2	85.0	317.7	692.1	167.0	13.1	70.1	287.7	644.9
France	85.5	11.7	56.2	144.3	271.3	92.0	12.1	63.7	153.3	289.0
Germany, Federal Republic	102.3	7.4	47.4	170.0	396.8	100.3	7.9	51.0	159.0	382.9
Switzerland	107.6	8.7	71.1	181.6	357.7	105.1	8.7	54.2	195.5	356.6
Weighted Average	115.2	9.7	59.7	202.3	420.1	110.2	9.9	57.7	187.5	408.1

*Adjusted on basis of age distribution of the U.S. total population, 1940.
Note: France data for 1981 not available; 1980 figures used.
Source of basic data: *World Health Statistics Annual* and various government annual reports.

Male Experience More Favorable

Contrary to the distressing mortality experience among women, the trend among men is very encouraging. Between 1976 and 1981 the age-adjusted death rate from lung cancer for men 35-74 years of age decreased in seven of the 10 Western European countries and rose by only 4 percent in the United States and 5 percent in Canada. Somewhat larger death rate increases were recorded in France and Denmark, while a significant rise occurred in Norway.

Substantial international disparities exist in lung cancer mortality rates. In 1981 the death

Table 2—Mortality from Cancer of the Trachea, Bronchus and Lung Among Women in Selected Countries—1976 and 1981
Death Rate per 100,000

Country	1976 Ages 35-74*	1976 Ages 35-44	1976 Ages 45-54	1976 Ages 55-64	1976 Ages 65-74	1981 Ages 35-74*	1981 Ages 35-44	1981 Ages 45-54	1981 Ages 55-64	1981 Ages 65-74
United States										
White	32.6	6.4	28.2	60.2	72.8	41.9	6.2	32.8	75.8	110.8
All Other	30.9	8.0	32.0	51.1	60.9	40.3	7.7	37.7	74.8	83.1
Total	32.5	6.6	28.6	59.3	71.7	41.8	6.4	33.4	75.6	108.1
Canada	22.0	4.2	18.2	39.7	52.9	32.2	5.4	25.8	58.2	81.9
Denmark	31.1	8.3	25.4	46.5	85.3	38.1	4.4	34.3	68.7	93.8
Norway	10.5	1.5	7.9	18.1	30.1	13.3	1.7	12.0	20.5	37.9
Sweden	12.4	2.6	8.2	21.9	35.1	17.6	3.3	12.2	31.3	49.0
Netherlands	9.6	1.7	8.7	13.8	27.6	13.7	2.7	13.3	22.0	32.6
Weighted Average	14.1	3.0	11.2	22.4	40.2	18.8	3.0	16.3	32.2	48.7
United Kingdom										
England and Wales	35.1	4.8	26.7	64.4	94.1	38.7	4.2	23.7	73.2	117.2
Northern Ireland	29.3	6.1	17.9	62.7	68.1	33.9	3.4	21.0	72.2	89.8
Scotland	42.8	6.4	37.1	78.7	101.8	55.9	6.9	36.7	107.0	158.8
France	7.3	1.9	4.8	11.9	21.4	7.7	1.3	6.4	11.7	22.8
Germany, Federal Republic	11.1	1.8	6.9	18.9	34.9	12.3	1.9	8.8	19.2	38.9
Switzerland	10.1	1.5	8.7	16.8	27.1	11.6	2.9	7.2	19.7	34.0
Weighted Average	17.7	2.7	12.6	33.2	49.4	19.7	2.6	12.8	36.3	60.2

*Adjusted on basis of age distribution of the U.S. total population, 1940
Note: France data for 1981 not available; 1980 figures used.
Source of basic data: *World Health Statistics Annual* and various government annual reports.

rate among men was only 47 per 100,000 in Sweden, followed by 66 per 100,000 in Norway and 92 per 100,000 in France. For the balance of the countries in this analysis, the age-adjusted death rate from lung cancer was 100 per 100,000 or higher. The mortality rate per 100,000 was 122 in the United States, 136 in England and Wales, 157 in the Netherlands, and as much as 167 in Scotland (3½ times that of Sweden).

Figure B compares the U.S. male age-adjusted death rate from lung cancer with that of their contemporaries in individual countries. As it shows, men aged 35-74 in England and

Wales, the Netherlands and Scotland continue to experience relatively higher mortality; but as a result of their more rapidly declining death rates, the differential has narrowed. Other countries in which the male mortality rate decreased faster than in the United States include Northern Ireland, Germany, Switzerland and Sweden. Between 1976 and 1981 the mortality ratio increased in Norway, although it still is just about half that in the United States. In France, the 1981 male death rate is three-fourths the rate in the United States—just slightly higher than in 1976. During this 5-year period, the gap in the mortality disparity closed slightly in Canada and has been nearly eliminated in Denmark.

With the exception of France, in 1976 and 1981, women recorded a larger increase in lung cancer death rates than did men—dramatically higher in some countries.

Increases With Age

Mortality from lung cancer increases rapidly with advance in age. Among men in the United States, the 1981 death rate per 100,000 rose from 12 at ages 35-44 to 76 at ages 45-54 to 213 at ages 55-64 and to 403 per 100,000 at ages 65-74. This progression in death rates was experienced in the other countries, and also occurred among women.

Between 1976 and 1981, with the exception of France, women recorded a larger increase in lung cancer death rates than did men (dramatically higher in some countries). Nonetheless, death rates among females were still a fraction of that of males. For persons aged 35-74, in 1981, the mortality rate for women in the United States was one-third the size of the rate for men. However, this was the second highest percentage, exceeded only by the experience in Sweden. On the other hand, in France, and in the Netherlands, the female mortality rate was less than one-tenth the rate for males. For the group of highly industrialized countries of Western Europe and the Scandinavian countries and the Netherlands, the death rate for lung cancer among men was almost six times as high as that for women. The ratio diminished to 3 to 1 in Canada. Tables 1 and 2 present, for males and females separately, the age-specific mortality rates from lung cancer. □

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Regional Variations in Costs of Tonsillectomy and Adenoidectomy

Tonsillectomy and adenoidectomy surgery (T&A) historically has been one of the most frequently performed major childhood operations. These surgeries have been growing fewer in number in the United States and other developed countries for more than two decades, however, and American T&A rates are decreasing faster than the decline in the childhood population.[1,2,3] In 1983, 424,000 T&A surgeries were performed in short-stay nonfederal hospitals across the United States—a 48 percent decrease from the number of such surgeries registered in 1974.[4] The majority of these surgeries are performed on persons under 18 years old and are more frequently performed on females (56 percent in 1983).

In 1974 a tonsillectomy and adenoidectomy operation was the third most frequently performed surgery across the country; T&A dropped to fifth place in 1978, to 10th place in 1980 and below 10th, thereafter.[4] The rate is down from 3.9 per 1,000 population to 1.8 over these 10 years. Nonetheless, T&As remain one of the most commonly performed surgical procedures among children in this country, and the justification for these operations continues to generate controversy, concern and study.

Metropolitan Life Study

Based on group health insurance total claims paid by the Metropolitan Life Insurance Company, Corporate Health Strategies, Inc., linked hospital and physician claims for T&As, including charges and length of stay. The study group consisted of 9,183 typical* T&A surgeries performed between January 1, 1982 and June 30, 1983, on employees and dependents insured under Metropolitan Life group health contracts across the United States. Average medical and surgical fees, and billed hospital charges, are presented in this analysis by state and region of the country.

The characteristics of this study group paralleled those of the national data. The surgeries were performed on patients ranging from 1 to 64 years old. The median age was 10, and nearly one-third of the T&As were performed on children 6 years old or younger. The vast majority of patients (73 percent) were under 18 years old; 17 percent were between the ages of 18 and 29. More than half (58 percent) of the surgeries were performed on females.

Presentation of claims data is restricted to the 23 states in which more than 100 T&As were performed on persons under 18; these data represent 81 percent of the reported cases. As seen in Table 1, there was considerable variation in the regional distribution of T&As. Twenty-one percent of the surgeries were performed in the East North Central area of the country and only 5 percent occurred in the New England states. The distribution of these operations by age of patient did not differ significantly by region or state, however.

Cost Variation by Age of Patient

The average total charge for a T&A performed on patients under 18 years old was $1,370, 13 percent or $200 less than that charged for the older group of patients. Some regional variations occurred in the amount of this difference but by and large they were relatively insignificant. The difference approximated the national difference in the majority of the states; New York, Utah, West Virginia, Virginia, Illinois,

* "Typical" surgeries are defined as those that fall within 97.2 percent of the usual length of stay criteria contained in the diagnosis related group (DRG) code

Table 1—Regional Distribution of Tonsillectomy and Adenoidectomy Procedures*
January 1, 1982—June 30, 1983

Geographic Area	Age				Total	
	17 and younger		18 and over			
	Number	Percent	Number	Percent	Number	Percent
United States	6,700	73.0	2,483	27.0	9,183	100.0
New England	316	4.7	147	5.9	463	5.1
Connecticut	105	1.6	56	2.3	161	1.8
Massachusetts	125	1.9	61	2.5	186	2.0
Middle Atlantic	625	9.3	247	9.9	872	9.5
New York	191	2.8	96	3.9	287	3.1
Pennsylvania	346	5.2	86	3.5	432	4.7
East North Central	1,409	21.0	483	19.4	1,892	20.6
Illinois	323	4.8	124	5.0	447	4.9
Indiana	249	3.7	79	3.2	328	3.6
Ohio	544	8.1	181	7.3	725	7.9
Wisconsin	200	3.0	57	2.3	257	2.8
West North Central	620	9.3	181	7.3	801	8.7
Iowa	176	2.6	42	1.7	218	2.4
Missouri	238	3.6	83	3.3	321	3.5
South Atlantic	1,143	17.1	437	17.6	1,580	17.2
Florida	199	3.0	108	4.3	307	3.3
Georgia	315	4.7	101	4.1	416	4.5
North Carolina	193	2.9	78	3.1	271	3.0
Virginia	102	1.5	51	2.1	153	1.7
West Virginia	111	1.7	16	.6	127	1.4
East South Central	628	9.4	184	7.4	812	8.8
Alabama	130	1.9	39	1.6	169	1.8
Kentucky	136	2.0	53	2.1	189	2.1
Tennessee	264	3.9	60	2.4	324	3.5
West South Central	1,139	17.0	436	17.6	1,575	17.2
Louisiana	325	4.8	97	3.9	422	4.6
Texas	633	9.4	264	10.6	897	9.8
Mountain	430	6.4	143	5.8	573	6.2
Colorado	102	1.5	42	1.7	144	1.6
Utah	109	1.6	28	1.1	137	1.5
Pacific	390	5.8	225	9.1	615	6.7
California	337	5.0	203	8.2	540	5.9

*Surgeries performed on employees and dependents of group health customers of Metropolitan Life Insurance Company.
Source: Claims data from Metropolitan Life Insurance Company, merged and edited by Corporate Health Strategies, Inc., analysis by Health and Safety Education Division personnel.

Tennessee and Connecticut, however, recorded charges 20 percent or more for a T&A performed on an older person than for the same procedure on a patient 17 years old or younger.

Across the country, when age of patient was considered, average physician charges differed by only $20 for these operations, e.g., $390 for pediatric patients (17 and under), and $410 for those older. Because costs of T&A surgery differed more significantly by geography than by the patient's age at the time of the operation, the claims data were combined and results analyzed for *all* T&As, regardless of age.

Regional Variation in T&A Costs

According to Metropolitan Life statisticians, the average total charge for a T&A in the United States was $1,430, with considerable variation between regions (Figure, page 31). The lowest

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Between 1982 and mid-1983, the average total charge for a T&A was $1,430, with considerable variation between regions.

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total cost was $1,270 recorded in the Mountain region, and this amount was 11 percent below the national average. The highest cost, $1,740, was reported in the Pacific region and was largely due to charges from California. The Pacific average total charges were 22 percent above the national total and 37 percent above the lowest regional costs. It seems noteworthy that the regions with the highest and lowest charges for T&A have such close geographic proximity. The second highest average total cost was reported in the West South Central area ($1,500), but these charges represented only a 5 percent increase.

State Variation in Costs

As seen in Table 2, substantial variation in charges for T&As was evident between individual states. There was a 74 percent difference in total charges between the high cost reported in California ($1,810) and the low cost reported in Utah ($1,040). The California charges were 27

There was a 74 percent difference in total T&A charges between the high cost in California ($1,810) and the low cost in Utah ($1,040).

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percent higher than the national average whereas the Utah charges were 27 percent lower. States with charges 10 to 20 percent above the U.S. average were Florida, Illinois and Massachusetts. Average total charges were 14 to 22 percent below the national total in Kentucky, Iowa, Wisconsin, North Carolina and Indiana, where the costs were $1,110, $1,200, $1,220, $1,230 and $1,230, respectively.

Physician Charges

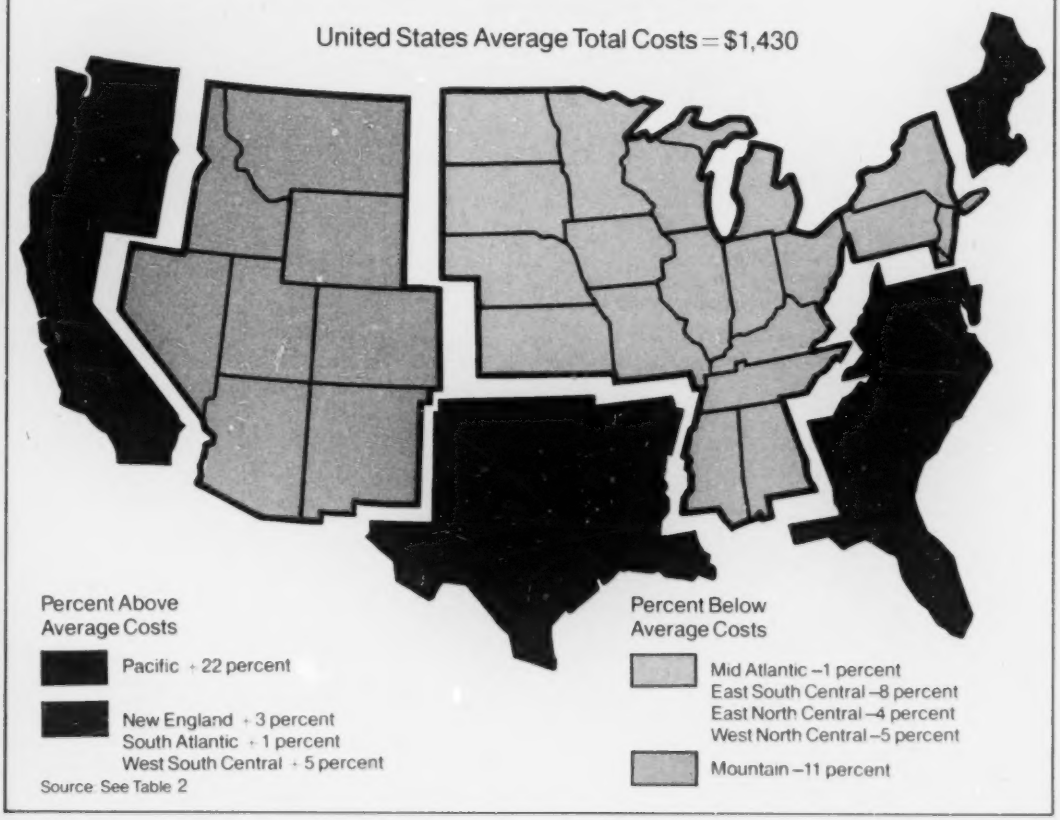
The average physician (medical and surgical) cost was $400 across the country, representing 28 percent of the total T&A bill. These charges

Table 2—Regional Variation in Charges for Tonsillectomy and Adenoidectomy*
January 1, 1982—June 30, 1983

Geographic Area	Average Costs ($)					Average Length of Stay	Percentage	
	Total Hospital & Physician	Hospital Charge			Physician Charge		Hospital of Total	Ancillary of Hospital
		Total	Room & Board	Ancillary				
United States	1,430	1,030	300	730	400	1.85	72	71
New England	1,480	1,080	350	730	400	1.90	73	68
Connecticut	1,470	1,020	350	670	450	2.02	69	66
Massachusetts	1,580	1,170	360	810	410	1.78	74	69
Middle Atlantic	1,410	990	300	690	420	1.65	70	70
New York	1,340	880	310	570	460	1.63	66	65
Pennsylvania	1,480	1,110	310	800	370	1.71	75	72
East North Central	1,370	1,000	310	690	370	1.78	73	69
Illinois	1,690	1,250	380	870	440	1.95	74	70
Indiana	1,230	880	270	610	350	1.78	72	69
Ohio	1,300	940	290	650	360	1.67	72	69
Wisconsin	1,220	900	280	620	320	1.87	74	69
West North Central	1,360	1,020	300	720	340	1.89	75	71
Iowa	1,200	860	310	550	340	1.94	72	64
Missouri	1,470	1,120	310	810	350	1.91	76	72
South Atlantic	1,440	1,040	280	760	400	1.96	72	73
Florida	1,720	1,230	300	930	490	1.97	72	76
Georgia	1,420	1,030	250	780	390	2.01	73	76
North Carolina	1,230	910	260	650	320	2.07	74	71
Virginia	1,460	1,080	280	800	380	1.78	74	74
West Virginia	1,510	1,110	300	810	400	1.99	74	73
East South Central	1,310	960	260	700	350	2.03	73	73
Alabama	1,430	1,080	260	820	350	2.09	76	76
Kentucky	1,110	760	270	490	350	1.86	68	64
Tennessee	1,350	1,020	270	750	330	2.06	76	74
West South Central	1,500	1,050	260	790	450	1.95	70	75
Louisiana	1,500	1,070	230	840	430	1.87	71	79
Texas	1,530	1,070	280	790	460	2.02	70	74
Mountain	1,270	920	270	650	350	1.59	72	69
Colorado	1,330	940	290	650	390	1.52	71	69
Utah	1,040	770	250	520	270	1.54	74	68
Pacific	1,740	1,260	390	870	480	1.70	72	69
California	1,810	1,310	400	910	500	1.72	72	69

*Surgeries performed on employees and dependents of group health customers of Metropolitan Life Insurance Company
Source: Claims data from Metropolitan Life Insurance Company, merged and edited by Corporate Health Strategies, Inc.; analysis by Health and Safety Education Division personnel.

Tonsillectomy and Adenoidectomy Charges by Geographic Region, January 1, 1982-June 30, 1983


United States Average Total Costs = $1,430
Percent Above Average Costs
Pacific + 22 percent
New England + 3 percent
South Atlantic + 1 percent
West South Central + 5 percent
Percent Below Average Costs
Mid Atlantic –1 percent
East South Central –8 percent
East North Central –4 percent
West North Central –5 percent
Mountain –11 percent

Source: See Table 2

ranged from $500 in California to $270 in Utah. 28 and 26 percent of the total cost, respectively. New York, Texas and Florida each reported relatively high physician charges (15 to 23 percent above the average for the United States). The New York physician charge comprised 34 percent of the total T&A bill—the highest proportional charge among the states in the study.

Hospital Charges

On average, 72 percent of the cost of a T&A was attributed to hospital charges (ancillary and room and board fees). By state, this proportion of the charges ranged from 76 percent in Missouri, Alabama and Tennessee to 66 percent in New York. The average hospital charges were 20 percent or more above the

U.S. average in California and Illinois, whereas in Kentucky and Utah, the hospital costs were at least 25 percent below.

The majority of the hospital bill (71 percent) was for the provision of ancillary services, i.e., laboratory work, operating and recovery room fees, anesthesia, etc. These charges typically ran two to three times the costs of room and board with wide between-state variation evident. In Louisiana, for example, ancillary service charges were 79 percent of the hospital bill compared with 64 percent in Iowa and Kentucky. The average ancillary charges were the highest in Florida and California, $930 and $910, respectively, which were more than 20 percent above the national average. In contrast, Kentucky, Utah, Iowa and New York reported ancillary charges of $490, $520, $550 and $570, respectively, 22 percent or more below the norm.

Regional variation in charges was fairly extensive in each of the cost categories examined.

As described above, regional variation in charges for a T&A was fairly extensive in each of the cost categories examined. The reasons for these differences are usually attributed to the socioeconomic conditions of the region as well as the regional medical training and practices of the physicians. Whatever the reasons for the variations in costs, an equally important issue is the justification for the procedure. The rates of T&As are declining as more and more physicians and their constituents are being educated about the need for and efficacy of this procedure. In this era of improved health, increasing advocacy of less drastic medical treatment, and the rise in second opinion requirements, the rates of T&As will no doubt continue to decline, thus reducing the proportion of the health care dollar attributed to this surgery.

Whether T&As can or will routinely become an outpatient procedure is a decision currently being debated. The ultimate decision, of course, resides with the patient, family and the physician. Increased professional and public health education will help make this decision an informed and increasingly safe one. □

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STATISTICAL BULLETIN

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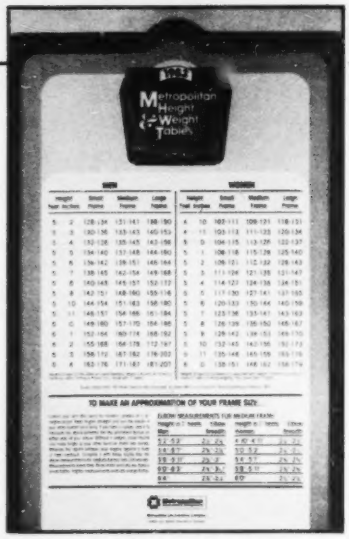
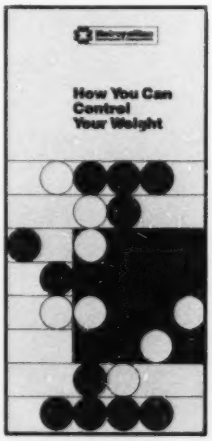
Health and Safety Education Materials Available From Metropolitan



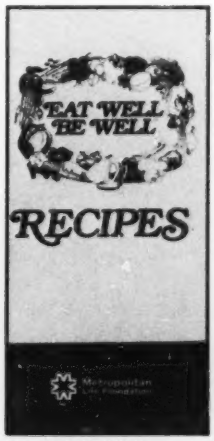
1983 Metropolitan Height and Weight Chart. Weights by height based on lowest mortality for men and women of small, medium and large frames. (18 by 27 inches)

EAT WELL BE WELL
1 Eat a Variety of Foods
2 Maintain Ideal Weight
3 Avoid Too Much Fat, Saturated Fat, and Cholesterol
4 Eat Foods with Adequate Starch and Fiber
5 Avoid Too Much Sugar
Avoid Too Much Sodium
7 If You Drink Alcohol, Do So in Moderation
Metropolitan

Eat Well, Be Well Poster. Bright garland of fruits and vegetables plus 7 dietary guidelines for wise eating and good health. (17 x 22 inches)

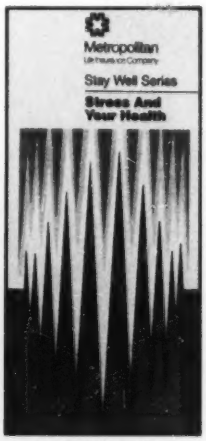


How You Can Control Your Weight. Leaflet offers effective ways to lose weight safely and maintain the loss. Specific nutrition information.



Eat Well, Be Well Recipe Booklet. 12 recipes based on the 7 dietary guidelines for meals low in fat, cholesterol, sugar and salt.

Exercise. Leaflet describes benefits of various types of exercises. Tips on relaxation plus exercises to do at home or in the office.



Stress and Your Health. Describes different types of stress, effects on the body, warning signs, and offers tips on minimizing tension.

For Further information, write to: Health and Safety Education Division, Dept. SB, Metropolitan Life Insurance Company, One Madison Avenue, New York, N.Y. 10010.

Coming in Future Issues

- Profile of Population Under Age Eighteen
- International Comparison of Life Expectancy at Selected Ages
- State Variations in Mortality Rates From Cancer
- Teenage Pregnancy: Nationwide Trends

Historical Perspectives

40 YEARS AGO

IN THE 1945 STATISTICAL BULLETIN

Twenty years' progress in child health conservation was disclosed by Metropolitan statisticians. Between 1922-23 and 1942-43, mortality among children 5-14 insured by Metropolitan decreased by 65 percent. For every two children who died under the 1942-43 mortality conditions, more than five would have died if the 1922-23 death rate had prevailed. The most spectacular gains were scored against the principal communicable diseases of childhood, where death rates decreased by at least 93 percent during the 20-year period. Then, rheumatic fever ranked first among the causes of death at ages 5-14. Mortality rates at the school ages had fallen to such low levels that possibilities of further reductions were limited. Therefore, continued progress would depend upon prevention or control of rheumatic fever, tuberculosis and accidents. (Page 9, January) □

The war against tuberculosis was being won. Metropolitan Life, through its systematic effort of annual medical examinations and a free sanatorium where necessary, had virtually eradicated TB among its employees. The Company's success served as a guide and encouragement to the whole tuberculosis movement. Following the success over TB, the emphasis shifted to the difficult problem of the cardiac diseases. Cardiovascular diseases accounted for almost one-half of all deaths in the United States. (The situation remains virtually unchanged after 40 years—ed.) Life insurance companies united their efforts to fund research in order to discover the cause and eventual prevention of cardiovascular diseases. (Page 4, June) □

Progress had been made in reducing mortality from home accidents. Modernization of the American home had made it a safer place in which to live and work. Education programs had alerted people to home hazards and how they could be minimized or eliminated. A study of Metropolitan Life policyholders aged 15-74 showed a drop of about 40 percent in the age-adjusted death rate from home accidents between 1933-34 and 1943-44 among adults. Among children aged 1-14 mortality declined in the early years of the decade, but then rose, reflecting wartime conditions that deprived youngsters of parental supervision and other safeguards. Home accidents claimed about 32,000 lives annually and ranked ninth among the causes of death. (Page 8, November) □

The *Statistical Bulletin* celebrated 25 years of publication. Metropolitan Life, by monitoring the mortality of its numerous policyholders, was able to record and interpret its unique data. The *Statistical Bulletin* was also used to report the extensive welfare activities of the Company. Since its beginning, the *Statistical Bulletin* had reported on considerable advances achieved by the public health movement, e.g., the significant reductions of typhoid fever and the principal communicable diseases of childhood. Infant mortality also decreased by more than 50 percent and life expectancy increased by over eight years. The publication served as a guide to other agencies engaged in life and health conservation. (Page 1, January) □

Metropolitan examined the contour of the mortality curve in 22 selected countries of both hemispheres during 1936-38 to ascertain seasonal patterns. In 16 countries mortality reached its peak in the winter; the others peaked in the spring. The winter peak was caused largely by the respiratory diseases. Summer, on the other hand, was the season of most favorable mortality for the majority of countries with modern medical and health services. Yet for countries where health conditions were substandard, mortality peaked in both winter and summer. The summer increase was due to diarrheal and other intestinal diseases and reflected the higher infant mortality rate. Medical advances, such as sulfa drugs and penicillin, would eventually modify the configuration of the seasonal mortality curve. (Page 7, February) □

The trend in cancer mortality by site, was analyzed for the period 1911 to 1944. There was encouraging evidence that cancer patients were seeking medical care at an earlier stage in the disease and that their chances of survival had improved considerably. A representative sample of Metropolitan policyholders aged 1-74 confirmed that cancer death rates for various sites had generally declined. However, cancer of the lung and pleura showed an uninterrupted rise in mortality, but at a slower rate. This trend in cancer mortality was viewed with considerable optimism. Further progress and eventual control were seen as a major challenge to the medical profession and the public. (Page 1, July) □